

# Kay (Zekuan) Liu

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## EMPLOYMENT

**Amazon Web Service Security Analytics and AI Research** New York, NY

*Applied Scientist* Manager: Dr. Wei Ding 02/2025 – present

*Applied Scientist Intern* Manager: Dr. Ali Torkamani, Mentor: Dr. Jiahao Ding 05/2024 – 08/2024

- Contributed to the integration of security foundation model and anomaly detection models on cloud log data.
- Refactored internal anomaly detection toolkit and improved network log anomaly detection method.
- Enhanced domain reputation with scalable temporal graph Transformers.

**Amazon Buyer Risk Prevention, Applied Scientist Intern** Seattle WA, 05/2023 – 12/2023

- Alleviated the label imbalance problem in fraud detection with graph generation.

**Walmart Global Tech Sponsored Search, Data Scientist Intern** Sunnyvale CA, 05/2022 – 08/2022

- Improved query classification for sponsored search with heterogeneous graph embedding methods.

**Amazon Web Service AI Lab, Software Development Engineer Intern** Shanghai China, 05/2021 – 07/2021

- Contributed fraud detection related model examples and datasets to open-source graph machine learning library [DGL](#).

## EDUCATION

**University of Illinois Chicago (UIC)** 08/2021 – 09/2025

*Ph.D. in Computer Science*

Advisor: Prof. Philip S. Yu

Research Assistant: 2021-2022, 2024-2025, Teaching Assistant: 2022-2023 (Data Structures, Big Data Mining)

Dissertation: Generative Models Driven Graph Outlier Detection

**Beijing University of Posts and Telecommunications (BUPT)** 09/2017 – 07/2021

*Bachelor of Engineering in Internet of Things Engineering*, Outstanding Thesis Award

**Queen Mary University of London (QMUL)** 09/2017 – 07/2021

*Bachelor of Science (Engineering) with Honors, First Class, in Internet of Things* (Joint Program with BUPT)

## SELECTED PUBLICATIONS

Citations: **500+**. View full publication list on [Google Scholar](#).

- Liu, Kay**, Jiahao Ding, MohamadAli Torkamani, and Philip S. Yu. "TGTOD: A Global Temporal Graph Transformers for Outlier Detection at Scale." In *Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD)*. 2025.
- Liu, Kay**, Hengrui Zhang, Ziqing Hu, Fangxin Wang, and Philip S. Yu. "Data Augmentation for Supervised Graph Outlier Detection with Latent Diffusion Models." In *Learning on Graphs Conference (LoG)*. 2024.
- Liu, Kay**, Yingdong Dou, Yue Zhao et al. "BOND: Benchmarking Unsupervised Outlier Node Detection on Static Attributed Graphs." In *Thirty-sixth Conference on Neural Information Processing Systems (NeurIPS)*. 2022.
- Liu, Kay**, Yingdong Dou, Xueying Ding, Xiyang Hu, Ruitong Zhang, Hao Peng, Lichao Sun, and S. Yu Philip. "PyGOD: A Python Library for Graph Outlier Detection." *Journal of Machine Learning Research (JMLR)* 25, no. 141 (2024).
- Chang, Wenjing, **Kay Liu**, Philip S. Yu, and Jianjun Yu. "Enhancing Fairness in Unsupervised Graph Anomaly Detection through Disentanglement." *Transaction of Machine Learning Research (TMLR)* (2025).
- Chang, Wenjing, **Kay Liu**, Kaize Ding, Philip S. Yu, and Jianjun Yu. "Multitask Active Learning for Graph Anomaly Detection." *arXiv preprint arXiv:2401.13210* (2024).

## AWARDS

- ACCESS Discover Project 11/2024
- NeurIPS Scholar Award 10/2022
- UIC Graduate Student Council Travel/Conference Award 10/2022, 01/2023, 10/2024

## SERVICES

- Reviewer:** ICLR 25, NeurIPS 22-25, KDD 24-25, LoG 23-24, Big Data Research, Transactions on Cybernetics, TIST.
- External Reviewer:** KDD 22, CIKM 22, ASONAM 22, WWW 23, SIGIR 23, ECML-PKDD 23.

Last update: 09/23/2025